

**US Application N:o 10/748,207, Filing Date 12/31/2003, Name of Applicants: Hans Robert Holmqvist and Hans Göran Seger, Title of Invention: "Intelligent methods, functions and apparatus for load handling and transportation mobile robots".**

### **Abstract**

Disclosed are intelligent systems and functions for autonomous load handling vehicles such as wheel-loaders operating within limited areas and industrial environments. The vehicle is provided with a laser-optic system for determining the vehicle's position in six degrees of freedom comprising x, y, z, heading, pitch and roll, in fixed to ground coordinates. This system is used for autonomous vehicle navigation and as reference for on board terrain mapping sensors and a dynamic terrain model. The admitted work area for autonomous vehicle operation is divided in loading, unloading and obstacle free zones, each with specific rules for the vehicle's behaviour concerning, mission planning, vehicle and implement movement and control, and obstacle detection and avoidance. The dynamic terrain model is employed for planning and analysing paths, for detecting and avoiding obstacles, and for providing data for optimizing vehicle paths and the movements of its implements in loading and unloading operations.